

Application No.: 09/837800

Case No.: 48317US033

In the Claims:

1-32 (canceled)

33. (currently amended) A filtering face mask that comprises:

(a) a mask body that is adapted to fit over the nose and mouth of a wearer, the mask body comprising a filtration layer through which inhaled air may pass before being inhaled by a wearer of the face mask; and

(b) an exhalation valve that is attached to the mask body directly in front of where the wearer's mouth would be when the mask is worn, the exhalation valve allowing air exhaled by a wearer to pass from an interior of the mask body to its exterior without having to pass through the filtration layer, the exhalation valve comprising:

(1) a valve seat that comprises:

(i) a seal surface; and

(ii) an orifice that is circumscribed by the seal surface; and

(2) a single flexible flap that has only one stationary portion and only one free portion and a circumferential edge, the circumferential edge having a first segment that is associated with the only one stationary portion of the flap so as to remain at rest during an exhalation and having a second segment that is associated with the only one free portion of the flexible flap so as to be lifted away from the seal surface during an exhalation, the second segment of the circumferential edge also being located below the first segment when the filtering face mask is worn on a person, the flexible flap being mounted to the valve seat such that the one free portion of the flap exhibits a curvature over the orifice area when viewed from the side in the closed position and is pressed towards the seal surface in an abutting relationship with it, under any orientation of the exhalation valve, when a fluid is not passing through the orifice.

34. (previously added) The filtering face mask of claim 33, wherein the flexible flap is not wholly circular in configuration when viewed from the front.

35. (previously added) The filtering face mask of claim 33, wherein the second segment of the circumferential edge has a circular curvature that corresponds to a circularly shaped seal surface disposed beneath the second segment of the flap's circumferential edge.

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36. (previously added) The filtering face mask of claim 33, wherein the valve seat has a flap retaining surface, the flexible flap being mounted to the flap-retaining surface.

37. (previously added) The filtering face mask of claim 36, wherein the flap retaining surface is planar.

38-49 (canceled)

50. (previously added) The filtering face mask of claim 33, wherein the valve seat includes a flange portion that defines a mounting surface for the valve seat, which surface extends 360° around the valve seat at its base and enables the valve seat to be secured to the mask body.

51. (previously added) The filtering face mask of claim 33, wherein the flexible flap assumes a curved profile, when in its closed state, that extends in from where the flexible flap contacts a retaining surface on the valve seat to where the second portion of the flexible flap contacts the seal surface of the valve body portion.

52. (previously added) The filtering face mask of claim 33, wherein the flap retaining surface is oriented transversely relative to the orifice.

53. (previously added) The filtering face mask of claim 52, wherein the flap retaining surface is positioned adjacent one side of the orifice.

54 (canceled)

55. (previously added) The filtering face mask of claim 33, wherein the flexible flap is mounted to the valve seat in cantilever fashion.

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56. (previously added) The filtering face mask of claim 33, wherein the valve seat is made from a relatively light-weight plastic that is molded into an integral one-piece body.

57. (previously added) The filtering face mask of claim 33, wherein the seal surface is substantially uniformly smooth to insure that a good seal occurs between the single flexible flap and the seal surface, and wherein the flexible flap is made from a material that is capable of allowing the flap to display a bias towards the seal surface, and wherein the flexible flap would normally assume a flat configuration when no forces are applied to it.

58. (previously added) The filtering face mask of claim 57, wherein the bias towards the seal surface is generated by the mounting of the flap to the valve seat.

59. (previously added) The filtering face mask of claim 58, wherein the flexible flap has a stress relaxation sufficient to keep the flexible flap in an abutting relationship to the seal surface under any static orientation for 24 hours at 70 °C.

60. (previously added) The filtering face mask of claim 59, wherein the flexible flap is made from a crosslinked polyisoprene.

61. (previously added) The filtering face mask of claim 58, wherein the flexible flap has a Shore A hardness of about 30 to 50 and has a generally uniform thickness of about 0.2 to 0.8 millimeters.

62. (previously added) The filtering face mask of claim 33, wherein the flexible flap is longer in the direction extending from the first segment of the circumferential edge to the second segment.

63. (previously added) The filtering face mask of claim 33, wherein the first segment of the flexible flap is about 10 to 25 percent of the total circumferential edge of the flexible flap, and the second segment is about 75 to 90 percent being free to be lifted from the seal surface.

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64. (previously added) The filtering face mask of claim 44, wherein the flexible flap and valve cover are positioned on the valve seat such that exhaled air is deflected downward during an exhalation when the filtering face mask is worn on a person.

65. (previously added) The filtering face mask of claim 33, wherein the mask body is cup-shaped and comprises (1) a shaping layer for providing structure to the mask, and (2) a filtration layer.

66. (previously added) The filtering face mask of claim 33, wherein at least 60 percent of the total airflow flows through the exhalation valve under a normal exhalation test.

67. (previously added) The filtering face mask of claim 33, wherein at least 73 percent of the total airflow flows through the exhalation valve under a normal exhalation test.

68. (previously added) The filtering face mask of claim 67, wherein the exhalation valve is positioned on the mask body substantially opposite to a wearer's mouth.

69. (previously added) The filtering face mask of claim 36, wherein the flap-retaining surface is not disposed substantially in the path of the exhale flow stream.

70. (previously added) The filtering face mask of claim 33, wherein the orifice includes a plurality of openings, which plurality of openings are disposed within the orifice beneath the point where the flexible flap is mounted to the valve seat when viewing the filtering face mask from the front in an upright position.

71. (previously added) The filtering face mask of claim 70, wherein the exhaled air passes primarily through a plurality of openings during an exhalation.

72. (previously added) The filtering face mask of claim 71, wherein the valve seat includes a flap-retaining surface that is located outside the region defined by the plurality of openings.

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73. (previously reinstated) The filtering face mask of claim 37, further comprising a valve cover, the valve cover having an opening that allows exhaled air to pass therethrough and also having a surface that holds the flexible flap against the flap-retaining surface on the valve seat.

74. (previously reinstated) The filtering face mask of claim 73, wherein the flexible flap is mounted to the valve seat by mechanical clamping.

75. (previously reinstated) The filtering face mask of claim 74, wherein the flap-retaining surface is disposed on the valve seat on one side of the seal surface.

76. (previously reinstated) The filtering face mask of claim 37, wherein the flap-retaining surface includes two securement points both disposed outside a region encompassed by the orifice.

77. (previously reinstated) The filtering face mask of claim 36, wherein the curvature in the flexible flap extends from a point where the flap is mounted to the valve seat to a second point where the free portion of the flexible flap makes contact with the seal surface.

78. (previously reinstated) The filtering face mask of claim 77, wherein the curvature does not have an inflection point.

79. (previously reinstated) The filtering face mask of claim 33, further comprising a valve cover that has an opening that permits exhaled air to pass therethrough, the valve cover also having a fluid-impermeable ceiling that increases in height in the direction of the flexible flap from the first segment of the circumferential edge towards the second segment of the edge.

80. (previously reinstated) The filtering face mask of claim 76, wherein the opening in valve cover is positioned directly in the path of fluid flow approximately parallel to the path

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traced by the second segment of the circumferential edge during opening and closing of the free portion of the flexible flap.

81. (previously reinstated) The filtering face mask of claim 33, wherein the valve seat's orifice is circular and has cross-members disposed within the orifice.

82. (previously reinstated) The filtering face mask of claim 33, wherein the valve seat includes one or more cross members that are disposed within the orifice of the valve seat.

83. (previously reinstated) The filtering face mask of claim 81, wherein the cross members are slightly recessed beneath the seal surface when viewed from a side elevation.

84. (previously reinstated) The filtering face mask of claim 81, wherein the shape of the orifice, when viewed from the front, does not wholly correspond to the shape of the seal surface.

85. (previously reinstated) The filtering face mask of claim 33, wherein the valve seat includes a peripheral flange for mounting the exhalation valve to the mask body, the valve seat also having a seal ridge that extends upwardly so that the seal surface is upwardly spaced relative to the peripheral flange.